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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/619,228	07/14/2003	Adam William Saxler	5308-247	7084

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EXAMINER	
FARAHANI, DANA	

ART UNIT	PAPER NUMBER
2814	

DATE MAILED: 09/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/619,228	SAXLER, ADAM WILLIAM	
	Examiner	Art Unit	
	Dana Farahani	2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 June 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-36,39 and 40* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *39 and 40* is/are allowed.

6)☒ Claim(s) *1-25,27 and 29-36* is/are rejected.

7)☒ Claim(s) *26 and 28* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-7 and 9-15 are rejected under 35 U.S.C. 102(e) as being anticipated by Bensahel et al., hereinafter Bensahel (US Patent Application Publication 2002/0039833).

Regarding claims 1 and 9, Bensahel discloses in figure 3, a semiconductor device comprising a wide bandgap semiconductor layer 20 having an array of discontinuous wide bandgap semiconductor regions 21 therein that contribute to a reduction in ionization energies of dopants in said wide bandgap semiconductor layer relative to an otherwise equivalent wide bandgap semiconductor layer that is devoid of the array of discontinuous wide bandgap semiconductor regions.

Regarding claims 2 and 10, the array of discontinuous wide bandgap semiconductor regions is a three-dimensional array, as can be seen in figure 2.

Regarding claims 3 and 11, the wide bandgap semiconductor layer has a plurality of two-dimensional arrays of discontinuous wide bandgap semiconductor regions therein that are parallel to each other, as can be seen in figure 2.

Regarding claims 4 and 12, the discontinuous wide bandgap semiconductor regions in the array are non-uniformly spaced from each other, as can be seen in the figure.

Regarding claims 5 and 13, the discontinuous wide bandgap semiconductor regions in the array have non-uniform sizes and shapes, as can be seen in the figure.

Regarding claims 6 and 14, the wide bandgap semiconductor layer has a plurality of two-dimensional regular arrays of discontinuous wide bandgap semiconductor regions therein that are parallel to each other, as can be seen in the figure.

Regarding claims 7 and 15, the plurality of two-dimensional regular arrays of discontinuous wide bandgap semiconductor regions are staggered relative to each other, as can be seen in the figure.

3. Claim 17 is rejected under 35 U.S.C. 102(e) as being anticipated by Chua et al., hereinafter Chua (US Patent Application Publication 2003/0059971).

Chua discloses in figure 1, a group III nitride layer comprising an array of discontinuous group III nitride regions therein that have a wider band gap relative to the group III nitride layer.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 8, 16 and 29-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bensahel as applied to claim 1 above, and further in view of Chua.

Bensahel discloses the claimed invention, as discussed above, except for expressly disclosing the discontinuous wide bandgap semiconductor regions are heavily doped.

Chua teaches that by varying the band gap (or doping a material) of a group III nitride, the light spectral range of the light emitting device, in which the material is used can be controlled (see page 1, paragraph 3). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to heavily dope the droplets in the Bensahel structure in order to emit a desired color light from the structure, when it is used in a light emitting device (note that the structure of the Bensahel could be utilized in a light emitting device. See page 1, paragraph 3).

6. Claims 18-25 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chua as applied to claim17 above, and further in view of Bensahel.

Chua discloses the limitations in the claims, as discussed above, except for a two, or three dimensional array of the discontinuous regions, or that the regions are nonuniformly spaced from each other.

Bensahel, on the other hand discloses these features of the quantum dot droplets, as discussed above. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the method of the Bensahel reference to grow the droplets of the Chua reference, since the method is advantageous and provides a faster growth rate of the droplets (see the abstract).

Allowable Subject Matter

7. Claims 39 and 40 are allowed.

8. The following is an examiner's statement of reasons for allowance:

The primary reason for indication of allowability of claims 39 and 40 is the inclusion therein of the limitation that of the two wide band gap materials each having wide bandgap islands therein, and have opposite conductivity types.

9. Claims 26 and 28 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

10. The following is a statement of reasons for the indication of allowable subject matter:

The primary reason for indication of allowability of claims 26 and 28 is the inclusion therein of the limitation that of the nitride layer comprising AlInGaN material.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dana Farahani whose telephone number is (571)272-1706. The examiner can normally be reached on M-F 9:00AM - 6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael M Fahmy can be reached on (571)272-1705. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

D. Farahani

LONG PHAM
PRIMARY EXAMINER